

University of Groningen

Autism's anatomy

Verhoeff, Berend

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2015

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Verhoeff, B. (2015). *Autism's anatomy: A dissection of the structure and development of a psychiatric concept*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

7 | Kurt Goldstein on autism⁷⁷

A physician's thought and activity are incomprehensible without the concepts of the normal and the pathological. (Canguilhem, 2008: 121)

An organism that actualizes its essential peculiarities, or – what really means the same thing – meets its adequate milieu and the tasks arising from it, is “normal.” Since this realization occurs in a specific milieu in an ordered behavioral way, one may denote ordered behavior under this condition as normal behavior. (Goldstein, 1934: 325)

Abstract

Autism research is facing profound difficulties. The lack of clinically valuable translations from the biomedical and neurosciences, the variability and heterogeneity of the diagnostic category, and the lack of control over the ‘autism epidemic,’ are among the most urgent problems facing autism today. Instead of encouraging the prevailing tendency to intensify neurobiological research on the nature of autism, I argue for an exploration of alternative disease concepts. One conceivable alternative framework for understanding disease and those we have come to call autistic, can be found in the work of neurologist Kurt Goldstein (1878-1965). His person-centered approach provides radically new ways to investigate and intervene with the behavior we are accustomed to explain by the elusive entity called autism.

⁷⁷ This chapter is under review at *History and Philosophy of the Life Sciences*.

Introduction

Autism research seems to be hitting a wall. Up to now, the search for autism's neurobiological foundation has been largely unsuccessful. The increasingly complex neurodevelopmental image of autism (see, for example, Jeste and Geschwind, 2014; Happé and Frith, 2014), the lack of clinically valuable translations from the biomedical and neurosciences, and the variable, heterogeneous and irreducibly sociocultural diagnostic category of autism (Verhoeff, 2013/Chapter 3) expose some fundamental uncertainties of contemporary autism research. Bridging the gap between research and practice turns out to be much harder than expected (Bauman and Schumann, 2013). Moreover, the field of autism is unable to establish some form of control or vision regarding the expanding boundaries of abnormal social behavior (see Frances, 2013).

These difficulties partly stem from the idea of autism as a distinct biomedical disease and emerge when asking the fundamental question that guides, directs and dominates autism research, namely: 'What is autism?' And today, an answer to this question seems further away than ever. Nevertheless, answering this question becomes more and more pressing because of the growing need for better treatments, more precise diagnoses, classifications and prognoses, and early detection, intervention and prevention of autism.⁷⁸ Accordingly, despite the fundamental difficulties and uncertainties in autism research, neuroimaging, neurogenetics, social neuroscience and also epidemiological studies of autism are flourishing (see Bishop, 2010). Furthermore, autism is increasingly present in the popular imagination and an increasingly popular topic in social, historical and science studies (for example, Silverman, 2008; Evans, 2013). In short, autism's (social) reality is pervasive and the search for autism's nature is, albeit disappointingly fruitless, more active than ever.

However, irrespective of the seemingly unavoidable idea of autism as a diagnosable psychiatric disorder and irrespective of what future autism research might bring us, this paper explicitly tries to sidestep the idea of autism as a distinct diagnostic category and the persistent attempts to understand and

⁷⁸ Part of this need is motivated by financial rewards; a recent economic analysis estimated the cost of autism was more than that of any other medical or psychiatric condition (Buescher et al., 2014).

explain its identity. In this paper, I will not investigate – from whatever scientific, social, philosophical, pragmatic, phenomenological, historical or cultural perspective – autism’s reality. Instead, I will propose an alternative to the pervasive ‘ontological understanding of psychiatric disease’ in which psychiatric diseases exist independently of their unique appearances in particular individuals (see Temkin, 1977; Verhoeff, 2014/Chapter 4). Something of a conceivable alternative framework for understanding disease and the difficulties, impairments and suffering of those we have come to call autistic, I suggest, can be found in the work of neurologist Kurt Goldstein (1934/1995). In his ‘so-called holistic, organismic approach’ (p. 18), in which it is not a disease entity but the ‘performance of an organism’ (p. 42) that is central, symptoms ‘are only expressions of the organism’s attempt to deal with certain demands of the environment’ (p. 35). For Goldstein, disease, normality and recovery are states that cannot rely on a statistical norm or an assumed disease entity, but are founded upon the person’s abilities. Symptoms and signs are not merely manifestations of an underlying disease process, as ‘no phenomenon should be considered without reference to the organism concerned and to the situation in which it appears’ (p. 40).

Goldstein’s ‘individual understanding of disease’ entails a different way of thinking about normal human functioning and abnormality. His understanding of disease challenges the divides that mark contemporary psychiatric thought – the divides between a disease and its milieu and between biological processes and social factors and contexts. Goldstein provides new ways to think about, investigate and intervene with the behavior we are now so accustomed to explain by the as yet unidentified entity called autism. In the section ‘Goldstein versus Kanner,’ I discuss Goldstein’s uninfluential article *Abnormal mental conditions in infancy* in which he explicitly opposes Leo Kanner’s understandings of autism. The section ‘Disease, health and the milieu’ uses the work of Georges Canguilhem to enrich and clarify Goldstein’s unorthodox notions of health and disease. But before that, and before I discuss Goldstein’s holism, his ideas about the ‘abstract attitude’ and ‘catastrophic reactions,’ and his person-centered approach in relation to the behaviors and impairments we have come to call autism, I want to say a bit more about recent developments in autism research. I hope to show why it might be time to start thinking beyond the idea of autism as a distinct diagnosable disease.

Autism in the brain

What is autism? After more than seventy years of both research and clinical experience with autism, this question remains almost as puzzling as when Leo Kanner introduced the syndrome in 1943 (Kanner, 1943). Very recently, eminent child psychiatrist Michael Rutter concluded that it is ‘decidedly odd that’ after such a long period of thorough and committed autism research, ‘there continue to be arguments on the nature of autism’ (Rutter, 2014: 55). Likewise, Christopher Gillberg – a well-known autism expert – acknowledged that ‘the fact is that we do not know what autism “is.” I have been in the field for forty years, and I can honestly say that I do not believe we are any closer now than [we were] twenty years ago to a real understanding of what it is about autism that makes experienced clinicians “certain” that it is autism regardless of whether operationalized criteria for the disorder are met or not’ (Gillberg in Waterhouse, 2013, ix). Nonetheless, despite (or maybe because of) the persistent elusiveness of autism, autism research has never been more vigorous. Additionally, the close linkages between diagnostic practices, the clinical and popular gaze of the – I must admit convincing – prototypical *Rain Man*-like autism case, the scientific attempts to identify unifying neurobiological mechanisms, and the biomedical understanding of psychiatric ailments in general make the very reality of autism something of a *fait accompli* (see Verhoeff, 2014/Chapter 4). Notwithstanding the persistent elusiveness that surrounds the unsolved puzzle of what we have come to call autism, the idea of autism as a distinct disease category plays a pivotal role in directing and structuring childhood mental health care.⁷⁹

Currently, the burden of delivering on the hopes and promises for a better understanding, treatment and prevention of autism lies on the (social) neurosciences. Mental disorders in childhood are increasingly conceptualized as ‘neurodevelopmental, meaning that they are linked to abnormal brain development’ (Insel, 2014: 1727). In the field of autism, unraveling ‘the social brain’ (Kennedy and Adolphs, 2012) and tracing the atypical neurodevelopmental trajectories related to delayed or abnormal social cognition has become the most promising route to progress (Happé and Frith, 2014).

⁷⁹ See Rosenberg (2002; 2006) and Jutel (2013) for more on the central role of disease entities in the many aspects of modern medicine. For autism in particular, see Verhoeff (2014)/Chapter 4.

Similarly, after rethinking autism's variation, complexity and complete absence of useful biomarkers (for diagnosis, prognosis, prevention or treatment), autism authority Lynn Waterhouse suggests that advances in the field of autism research 'will depend on increased knowledge of the genetics, epigenetics, and gene–environment interactions involved in brain development, as well as ... increased knowledge of individual brain circuits, the whole brain connectome, and the mechanisms of the dynamic processes involved in brain development'. She argues that 'future discoveries should be able to better isolate specific brain circuits that when disrupted result in neurodevelopmental social impairment' (Waterhouse, 2013: xiii).

These tendencies in autism research are in line with the 'Research Domain Criteria' (RDoC) project of the National Institute of Mental Health (NIMH). This project aims to develop a classification system based upon dimensions of neurobiology that reflects advances in genetics, neuroscience and cognitive science. Current descriptive diagnostic systems (and disease categories), it is argued, lack validity because they rely upon presenting signs and symptoms that 'do not adequately reflect relevant neurobiological and behavioral systems' (Cuthbert and Insel, 2013: 1). Progress in genomics and imaging, combined with computational abilities, is thought to facilitate the identification of 'biomedical tests for routine clinical practice' and neurobiologically homogeneous populations 'that [cut] across the traditional diagnostic boundaries while simultaneously transforming them' (Kapur et al., 2012: 1178). Even though this shift in focus 'from behavioral symptoms to neurodevelopmental trajectories' (Insel, 2014) is often presented as a 'paradigm shift,' it is not as radical as it seems. Indeed, methods used to identify biomarkers and underlying pathophysiologies differ, but fundamental assumptions about the nature of psychiatric disease remain unaffected – whether with *DSM-5* or RDoC, autism is thought of as a disease like any other medical disease. More specifically, autism is a *brain* disease and it is in this organ that an answer to the question 'what is autism?' can and should be found.

Even though autism's indispensability is facing several profound difficulties⁸⁰, the search for autism is far from stagnating. The obstacles of

⁸⁰ Historical variability of the concept of autism, heterogeneity in symptomatology, the lack of successful translations from bench to bedside (no biomarkers), the expanding boundaries of autism, and an increasingly complex picture of autism's neurobiology are few of the fundamental problems of current autism research.

autism research and autism neuroscience in particular do not lie in the innovative efforts of autism researchers creating new hypotheses related to autism's neurobiology (Verhoeff, 2014/Chapter 4). It is not the neurobiological, reductionist and context-neglecting approach of autism neuroscience itself that is hitting a wall. However, whether autism neuroscience proceeds constructively and whether it produces or will produce convincing scientific accounts of autism's neurobiology is far from clear. As it seems, the limits of autism neuroscience do not lie in the innovative efforts of autism researchers creating new hypotheses related to autism's neurobiology, but they lie, today at least, in successfully translating neuroscientific results into clinical care and practice.

Goldstein's holism

Very different from current neurobiological, reductionist and ontological approaches to autism is Kurt Goldstein's holistic-organismic approach to disease. Kurt Goldstein (1878-1965), a German neurologist and psychiatrist who wrote his major theoretical work *Der Aufbau des Organismus*⁸¹ right after his flight from Nazi Germany (Goldstein, 1934/1995), based his ideas about normal and abnormal living beings on his extensive research on aphasia and on his experience with treating and training those who incurred brain injuries during World War I. A lot can be, and has been, said about the socio-political context of national fragmentation and political instability that attracted many Germans to ideals of 'wholeness' in the interwar period (see, for example, Harrington, 1998; Hau, 2000; Rosenberg, 1998). However, for present purposes I will focus on Goldstein's understanding of disease and pathological behavior and how his holistic method provides a radically different 'style' of looking at those diagnosed as autistic.

In *Der Aufbau des Organismus*, Goldstein introduces a new holistic method by which he believed 'more justice may be done to the description and understanding of the behavior of normal and pathological living beings' (Goldstein, 1995: 17). Long-term observations of and neuropsychological tests with some 2000 brain-injured soldiers made Goldstein question the adequacy

⁸¹ Later translated as *The organism: A holistic approach to biology derived from pathological data in man*.

and usefulness of the conventional approach of 'cerebral localization' for understanding brain pathology. Knowing the exact location of a brain lesion in a wounded soldier did not help the therapy, nor could the location of a lesion, according to Goldstein, explain the extraordinary complexity of pathological behavior manifested by the patient. The basic error in analyzing brain lesions, Goldstein argued, was the assumption that 'cortical injury is usually followed by a loss of circumscribed functions, such as speech, visual perception, or motor performance. ... According to this conception, [neurologists like Carl Wernicke and Paul Broca] distinguished and designated various disease syndromes by such terms as aphasia in its various forms, visual agnosia, apraxia, and so on. They assumed also that circumscribed centers controlled those particular functions' (p. 33). Within this dominant localizationist model, 'we have become so accustomed to regard symptoms as direct expressions of the damage in a part of the nervous system that we tend to assume that, corresponding to some given damage, definite symptoms must inevitably appear' (p. 35). This way of thinking about neurological and psychopathological symptoms was 'borrowed from reflexology and the prevailing association psychology' (p. 36). According to the main 'reflex theory' of the medical and psychological sciences, the organism represented 'a bundle of isolable mechanisms that are constant in structure and that respond, in a constant way, to events in the environment (stimuli)' (p. 69). The idea of separate mechanisms (or modules) and the tight relationship between brain structure and function, and between specific stimuli and specific responses 'led to the supposition that circumscribed injuries would result in disorders specific to the mechanisms involved' (p. 36).

However, Goldstein challenged these central elements of the contemporary neurological localization of (mental) pathologies and the associationist psychology of reflex. The 'atomistic method⁸²,' he extensively argued, failed to provide a deeper understanding of the way the entire organism tried to compensate for internal disturbances. It failed to explain the organism's capacity to adapt and reorganize after severe trauma, and it was unable to account for recovery of function after brain injury. Furthermore, the localizationist model did not account for the well-recognized variability of symptomatology. As Harrington (1998: 28) puts it, 'the simple fact that brain-

⁸² For Goldstein, this method 'intended to designate any method which uses a dissecting procedure and tries to derive laws from the parts studied' (Goldstein, 1963: 3).

damaged people can get better over time, can regain lost speech and movement, was simply incompatible with the nineteenth century “machine” model of the nervous system as a purely mechanical apparatus operating according to fixed laws of reflex and association’.

Instead of focusing on specific lesions, reflexes and particular disturbances, and instead of assuming that individuals with similar lesions were affected in similar ways, Goldstein focused on the ‘performance’ of the individual organism, as it was affected by the disturbance. Brain damage, and cortical injury in particular, he argued, ‘does not result in the loss of isolated performances but in systematic disintegration following the principle that certain forms of behavior will be impaired while others remain intact’ (Goldstein, 1995: 45). To understand these impaired forms of behavior; that is, to ‘provide a meaningful description of the symptoms,’ it is necessary to take ‘into account the organism as a whole’ (p. 40). Not local lesions, but performances of the entire organism – defined by Goldstein as ‘any kind of behavior, activity, or operation ... that expresses itself overtly and bears reference to the environment’ (p. 42) – are essential in understanding pathological behavior. There is, Goldstein argues, no direct relation between a brain lesion and disruption of behavior:

Whether a certain symptom will appear on account of a local injury, especially whether it will become a permanent symptom, certainly depends on many factors: on the nature of the disease process, on the condition of the rest of the brain, on the state of the circulation, and on the psycho-physical constitution of the patient. It also depends on the ‘difficulty’ of that performance, the disturbance of which represents the symptom, and, finally, on the reaction of the entire organism to the defect. (p. 207)

Just as normal behavioral reactions are expressions of the organism’s attempt to deal with certain demands of the environment, symptoms (abnormal reactions) ‘are answers, given by the modified organism, to definite demands: they are attempted solutions to problems derived on the one hand from the demands of the natural environment and on the other from special tasks imposed on the organism in the course of examination’ (p. 35). This idea that symptoms and disease must be understood in relation to particular tendencies

and performances of the entire individual, and not in a bottom-up and atomistic manner from specific disturbance to specific behavior, is central in Goldstein's holistic alternative for investigating both normal and abnormal living human beings.

The abstract attitude, catastrophic reactions and coming to terms with the world

The analysis of behavioral changes in patients suffering from brain injuries led Goldstein 'to make a distinction between two modes of behavior – the abstract and the concrete' (Goldstein and Scheerer, 1941: 1). These modes of behavior, Goldstein argued, are dependent upon two corresponding attitudes that 'are not acquired mental sets or habits of an individual, or special isolable aptitudes, such as memory, attention, etc. Rather, they are *capacity levels of the total personality*' (original emphasis). In all his patients with brain injuries Goldstein noticed a diminished capacity for abstract thought and a strong tendency towards concrete behavior. In 'concrete' performances 'a reaction is determined directly by a stimulus, is awakened by all that the individual perceives. The individual's procedure is somewhat passive, as if it were not he who had the initiative'. In 'abstract' performances, on the other hand, 'an action is not determined directly and immediately by a stimulus configuration but by the account of the situation which the individual gives to himself. The performance is thus more a primary action than a mere reaction, and it is a totally different way of coming to terms with the outside world' (Goldstein, 1940/1963: 61-62). It is not isolated performances or cognitive functions, but the general abstract attitude – an essential attribute of the human being and the basis for '*conscious and volitional* modes of behavior' (Goldstein and Scheerer, 1941: 4) – that is affected in those with cortical brain injuries: 'We venture to remark that whenever the patient must transcend concrete (immediate) experience in order to act – whenever he must refer to things in an imaginary way – he fails. On the other hand, whenever the result can be achieved by manipulation of concrete and tangible material, he performs successfully' (Goldstein, 1995: 43).

Goldstein provides numerous examples of disturbed abstract performances. One patient, for instance, is asked to drive a nail with a hammer into a piece of wood. This task does not cause any difficulties. However, when the nail is taken

away and the patient is asked to imagine that there is a nail, he is unable to make the movement of hammering. Even if he sees the nail 'he is unable to make the movement of driving the nail in' (Goldstein, 1963: 45). Another patient could use a key to open a door, but was 'unable to demonstrate how to use a key without the door present' (Goldstein and Scheerer, 1941: 7). Some patients could find their way while walking from the hospital to their home, but they could not draw a map or give a verbal account of their route. They tended to succeed in the 'sphere of immediacy,' but failed in the more abstract 'sphere of the possible':

Each problem that forces him [the patient] beyond the sphere of immediate reality to that of the 'possible,' or to the sphere of representation, ensures his failure. This manifests itself in all responses such as action, perception, thinking, volition, feeling, and so on. The patient acts, perceives, thinks, has the right impulses of will, feels like others, calculates, pays attention, retains, and so on, as long as he is provided with the opportunity to handle objects concretely and directly. He fails when this is impossible. (Goldstein, 1995: 43)

One patient could throw a ball into different boxes at distinct distances. However, he could not estimate the distances nor could he say which box was nearer or farther. Another of Goldstein's patients could count on his fingers, but was unable to state whether 7 or 4 was more 'and had no concept of the value of numbers whatsoever' (Goldstein and Scheerer, 1941: 7). For these patients, words only referred to concrete objects, but categories, concepts, analogies and metaphors were not understood since abstractions of a common property were necessary. 'They fail on a simple syllogism or on tests of finding the common denominator of several items'. This disturbance in what Goldstein called 'categorical behavior' did not imply that patients were unable to select items, for instance from a heap of colored wooden skeins, on the basis of particular characteristics such as brightness, softness, or color. However, a patient 'who seems to be choosing according to a certain attribute is not able to follow this procedure voluntarily if it is demanded of him ... [and] he does not seem to be able to hold to a certain procedure' (Goldstein, 1963: 72). The lack of a grasp of the abstract, the lack of an approach to imagined things or

hypothetical situations, and the inability to reflect on one's acting or thinking are

also the reason [the brain-injured patient] can grasp a little story as long as it concerns a familiar situation in which he himself has participated. But he will not understand a story – certainly no more difficult for the average person – requiring him to place himself, in imagination, in the position of someone else. He does not comprehend metaphors or puzzles. He can manipulate numbers in a practical manner but has no concept of their value. He can talk if there is some concrete subject matter present but cannot recount material unrelated to him or report it in purely conceptual terms. He is incapable of representation of direction and localities in objective space, nor can he estimate distances; but he can find his way around very well and can execute actions that are dependent on perception of distance and size. ... The most general formula to which change can be reduced is probably that the patient has lost the capacity to deal with that which is not real – with the possible. (Goldstein, 1995: 43-44)

Pathological phenomena, Goldstein argued, should not be considered 'as curiosities caused by illness and therefore not intelligible in the same way as the behavior of normal individuals ... they become intelligible if one takes into consideration the characteristic alterations which illness produces' (Goldstein, 1963: 35). These alterations are not just the result of a disturbance of the abstract attitude directly caused by brain pathophysiology. Goldstein emphasized that a patient's reduced performance at a concrete level of functioning was also an adaptive reaction of the whole individual to preserve or return to an *ordered* condition and to avoid a *catastrophic* reaction. For Goldstein, this is a very important second distinction that helps to understand the injured condition of the organism: the distinction between *ordered* and *disordered* or *catastrophic* behavior. Again, this distinction can only be understood by considering 'the total behavior in which the individual performance appears' (Goldstein, 1995: 48).

In an ordered situation, responses appear to be constant, correct, adequate to the organism to which they belong, and adequate to the

species and to the individuality of the organism, as well as to the respective circumstances. The individual himself experiences them with a feeling of smooth functioning, unconstraint, well-being, adjustment to the world, and satisfaction, that is, the course of behavior has a definite order, a total pattern in which all involved organismic factors – the mental and the somatic down to the physicochemical processes – participate in a fashion appropriate to the performance in question. ... The ‘catastrophic’ reactions, on the other hand, are not only ‘inadequate’ but also disordered, inconstant, inconsistent, and embedded in physical and mental shock. In these situations, the individual feels himself unfree, buffeted, and vacillating. He experiences a shock affecting not only his own person, but the surrounding world as well. He is in a condition that we usually call anxiety. (Goldstein, 1995: 48-49)

Not only in ‘normal’ individuals, but also in brain-damaged patients, Goldstein recognizes a universal tendency toward ordered behavior and an avoidance of those situations that threaten the very existence of the individual, that is, catastrophic situations. Crucial in this tendency are the (often unconscious) attempts to ‘come to terms with the world,’ which means being able to handle or cope with the tasks and demands that inevitably arise in interaction with the environment. Ordered behavior or a correct and successful performance ‘is a coming to terms of the organism with environmental stimuli by a behavioral act, be this eyelid closure under stimulation or a total movement like running toward a goal, or hearing, seeing, and so on’ (p. 42). In the organism’s coming to terms with the world, or, in other words, in meeting ‘its adequate milieu and the tasks arising from it’ (p. 325) the environment of an organism ‘is by no means something definite and static but is continuously forming commensurably with the development of the organism and its activity ... an organism can exist only if it succeeds in finding in the world an adequate environment – in shaping an environment’ (p. 85). Ferrario and Luigi (pp. 217-218) note that in defining ‘performance’ – Goldstein’s central unit of investigation – as a ‘coming to terms,’ it is obvious that ‘the organism as a whole is always called into question, and that the organismic behavior will always be holistically oriented in line with this kind of “bio-ecological” finality’.

In Goldstein’s patients with brain injuries, the loss of the abstract attitude (that is, among other things, the lack of an approach to imagined things or

hypothetical situations and the inability to reflect on one's acting or thinking) diminished the capacity to cope with (new) tasks imposed by the environment. This made his patients extra vulnerable to catastrophic reactions and Goldstein systematically described the various and powerfully motivated adaptive strategies patients had developed to avoid the overwhelming anxiety of catastrophe, and to maintain, albeit in a reduced, rigid, and automatic manner, an adequate feeling of functioning and adjustment to the world. In other words, his patients tended toward concrete and ordered behavior: 'Avoiding catastrophic situations is possible only if he is able to come to terms with the world in spite of his defects – that is, only if he finds a new milieu which is appropriate to his defective condition, a milieu from which no stimuli arise which put him into a catastrophic condition' (Goldstein, 1963: 95).

One of the strategies, or 'substitute performances' as Goldstein calls them, is the patient's 'tendency towards excessive and fanatical orderliness'. For instance, in putting several objects at random on a table, the patient 'will at once arrange them in some order' (p. 101). After an examination with one of his patients, Goldstein drops his pencil on a sheet of paper and the patient immediately 'takes up the pencil, straightens the paper carefully so as to bring its sides parallel with the side of the table, and then as carefully places the pencil parallel to the margin of the paper'. When the pencil is put in an oblique position, the patient reacts once more by putting it in back into the parallel position. 'Apparently,' Goldstein argues, 'such a state of "disorder" is unbearable to him'. Furthermore, his patients are 'punctual in their daily activities, in bathing, going to bed, etc., doing everything at the prescribed time'. All patients with brain injury, Goldstein concluded, 'have a tendency toward such "primitive" order. ... The principal demands that "disorder" makes on them are choice of alternative, change of attitude, and rapid transition from one behavior to another. But this is exactly what is difficult or impossible for them to do' (Goldstein, 1995: 54). An unstructured, 'chaotic' environment creates tasks that make these demands, and catastrophic reactions and anxiety inevitably ensue. To avoid this anxiety the patient 'clings tenaciously to the order that is adequate for him but that appears abnormally primitive, rigid, and compulsive to normal people' (p. 54).

Another strategy, when confronted with a new task which the patient cannot perform, is endlessly repeating an earlier performance. The patient 'avoids a catastrophic situation indirectly *by busying himself with those things which he*

is able to do' (Goldstein, 1963: 99, original emphasis). The things the patient tends to cling to have 'the character of stereotypy and exhibit little variation' (Goldstein, 1995: 52). They keep the patient occupied and 'so secluded from the outside world that he remains unaffected by many events of his environment' (p. 53). Unexpected stimuli are dangerous and avoided as they might create a situation that demands a particular adjustment that the patient cannot make. The patient 'tries at all costs to avoid the unknown' (Goldstein, 1963: 100). Goldstein mentions that his patients go for a walk only if they have a specific goal. 'They do not stroll about, for strolling about contains in it many dangers of abrupt stimulation. Thus the patient avoids it, and may even resist going to a known goal by an unfamiliar route'.

A final strategy that I would like to discuss is the patient's 'avoidance of emptiness' or 'abhorrence of a vacuum, a *horror vacui*' (p. 104). When Goldstein's patients were faced with an empty space or a situation which did not contain a possibility for the patient to react upon, this caused the patient to become anxious and troubled. One patient, for instance, could not write on an empty sheet of paper. However, he could write if there was a line on the paper he could write upon. Another patient was unable to read letters or words if they were not written on a line. These incapacities, Goldstein argued, did not consist in an inability to read or write without lines, but 'in the inability to do anything without clinging to a given concrete object' (p. 105). His patients tried to avoid these kinds of situations of emptiness because empty space was not an adequate stimulus and demanded an abstract attitude, which was exactly what was lacking. They evaded the difficulties that arose in emptiness by clinging to a concrete object which they could cope with, 'knowing that as soon as he gives up his point of reference he will become helpless, ineffective, disturbed, and driven to catastrophic reaction' (Goldstein, 1995: 55).

All these substitute performances imply a tremendous restriction of the environment in which the patient lives: 'a defective organism achieves ordered behavior only by a shrinkage of its environment in proportion to the defect' (p. 56). Goldstein describes the various forms of pathological behavior and substitute actions from the perspective of the whole organism and not as the direct result of brain pathophysiology. For Goldstein, many particular symptoms could only be understood as a 'means by which existence can be maintained. In this sense, they are meaningful; they enable the organism to come to terms with the environment, at least in some way' (p. 52).

Goldstein versus Kanner: A different perspective on autistic behavior

As far as I can tell, there is only one paper by Goldstein in which he explicitly evaluates Leo Kanner's presentation and interpretation of the new syndrome of 'early infantile autism' (Goldstein, 1959; Kanner, 1943). Goldstein, who wrote *Der Aufbau* in 1934, was astonished by the way in which Kanner's autistic children (Kanner, 1943) reacted 'in ways closely reminiscent of brain-injured adults with impairment of abstraction' (Goldstein, 1959: 554). The inflexible and restricted behavior, the particular relationship to persons and objects, the inclination to have temper tantrums, the lack of imagination, the inability to understand jokes and metaphors, the inability to reflect on one's action or to take someone else's perspective, and the strong dependence on others for survival and finding a way in the complex world, were features that Goldstein repeatedly observed in both 'abnormal infants' and in brain-injured adults. He was convinced that 'the so-called autism and the "desire for the maintenance of sameness" could also be understood from our point of view, namely, that we are dealing with an impairment in the mental capacity, particularly of that function which we call abstract attitude' (p. 539).

Goldstein had already noticed that 'the ["normal"] child behaves, in some respects, similar to the brain-injured patient' (Goldstein, 1995: 238). The child is frequently confronted with tasks with which he cannot come to terms in an adequate way. Stimuli originating from the child's environment 'do not yet fit the organism of the child, they demand reactions corresponding to a more mature and more integrated organism than the child actually is' (p. 249). Anxiety and a need for predictability, regularity and, for instance, bedtime rituals play a great role in a child's life. The condition of infancy, Goldstein argued, 'is suited to bring about catastrophes easily ... Because the human child is born in an immature state, it is often exposed to inadequate conditions in the environment' (Goldstein, 1959: 538). Once separated from the mother's body, the child has lost 'the "adequate" condition of the womb, and is confronted with many catastrophes. It has to find a new "adequacy" if to survive and develop. That presupposes that the infant is protected against the dangers of the external world. This protection comes ... from the activity of persons around him' (p. 540). However, for a child with an 'abnormal mental condition,' this protection is not sufficient as he does not develop 'the abstract

capacity, which increasingly enables him to organize himself and his world, and so to guarantee his existence' (p. 541).

Goldstein's theoretical constructs of 'the abstract capacity' and 'catastrophic reactions' provide him with a different interpretation and explanation of the 'autistic' behavior originally described by Kanner. Kanner, for instance, emphasized a particular type of asymmetry regarding the way in which autistic children interacted with objects and persons. Kanner argued that his children 'are able to establish and maintain an excellent, purposeful, and 'intelligent' relation to objects that do not threaten to interfere with their aloneness, but are from the start anxiously and tensely impervious to people, with whom for a long time they do not have any kind of direct affective contact' (Kanner, 1943: 249). Yet, Goldstein argued that the children's particular interaction with both objects and person can be explained by an overarching lack of the abstract capacity. This involves an inability to handle and understand whole objects and a behavioral repertoire that is restricted to 'primitive' and concrete reactions to isolated stimuli. He argued that, with only primitive reactions available, 'there is very little the infant can do with the person' (Goldstein, 1959: 544). Objects, on the other hand, present more reactive possibilities to the child than do persons: 'the infant can grasp objects, move them, squeeze them, put them into his mouth; in a word, there is a varied performance repertoire available'. For Goldstein, it is not the case that these children behave normally toward objects and abnormally toward persons because, as Kanner thought, objects 'do not threaten to interfere with their [desire for] aloneness'. Instead, 'abnormal children show only reactions to parts – to those parts they can do something with "adequately" – although it may seem as if they are reacting to the whole object' (p. 544). Objects are just more appropriate than persons in the child's attempt to prevent catastrophe and to come into an ordered relationship with the environment.

Kanner explained the awkward social behavior of the autistic child – not making eye contact or not paying any attention to other people in the same room – by assuming that for the child, the other person does not exist because he has no emotional tie to others: 'these children have come into the world with innate inability to form the usual, biologically provided affective contact with people' (Kanner, 1943: 250). An 'inborn autistic disturbance of affective contact' and 'a powerful desire for aloneness and sameness' were, for Kanner, the basic deficits in early infantile autism. Goldstein saw something else. With

his idea of primitive reaction types, the ‘autistic’ child ‘reacts only to “stimuli” and not to whole persons’ (Goldstein, 1959: 545). Goldstein did not assume a specific (defective) inborn ability for affective contact. Persons were treated instrumentally, ‘not because the child has no feeling for the former but – due to his primitive way of reacting – because he has only one way to treat both persons and objects’ (p. 546). For Goldstein it was sufficient to assume that the autistic child ‘is urged to do something, and does what he is able to do in a particular situation, resisting demands that he do something he realizes he cannot do. When the demand is not so strong as to bring catastrophe, he seems not to pay attention to it’ (p. 545). The tasks and demands that arise in interaction with other people are too complex to handle; they require particular abstract abilities.

It was also unnecessary to assume a special drive for aloneness or repetition. Kanner’s assumption of an ‘obsessive desire for the maintenance of sameness’ could be explained as being analogous to the ‘tendency to orderliness and repetition’ of Goldstein’s brain-injured patients. Goldstein assumed that the repetitive behavior and the inflexible routines were the only reaction forms which permitted the autistic child ‘to come into an adequate relationship with the “world” and so actualize himself in striving to cope with the world. He sticks to it under all circumstances, and he comes into catastrophe when something is demanded of him that cannot be fulfilled in this way’ (p. 546). Thus, a small change in a routine or a disturbance of repetitive behavior implied new demands and a potentially dangerous, disordered situation. The repetitive behavior and the ‘aloneness’ should not be understood as intentional or desired, but simply as a function of the inability to do anything else, and due to this inability the child perseverates in these activities. Goldstein did not assume several specific drives that directed particular behavior, but assumed only *one* different kind of general driving force which determined both normal as well as abnormal behavioral conditions. This general driving force was the organism’s tendency to realize its possibilities, or, in other terms, a ‘tendency to actualize itself according to the circumstances’ (Goldstein, 1995: 355). For the child with deficiencies of the abstract attitude, who has only ‘primitive’ and concrete performances at his disposal, this ‘self-realization,’ as we will also see in the next section, ‘is possible only in a reduced form’ (Goldstein, 1959: 556).

Disease, health and the milieu

No contemporary author has cited Goldstein more frequently than the French philosopher of biology and medicine Georges Canguilhem. On the issue of normality, pathology, health, and the milieu, Canguilhem was deeply influenced by Goldstein's work.⁸³ When Canguilhem famously argued that 'health is the margin of tolerance for the inconstancies of the environment,' (Canguilhem, 1991: 197) or that 'disease is a narrowed mode of life, lacking in creative generosity because lacking in boldness ... characterized by new physiological constants,' he directly referred to Goldstein's clinical experiences and theoretical interpretations. As Geroulanos and Meyers (2012) also remind us, Canguilhem worked from a perspective influenced by 'the surgeon René Leriche and ... Kurt Goldstein, both of whom helped him to question the claim – which in France dated back to Francois-Joseph-Victor Broussais and Auguste Comte – that disease and the pathological condition more generally are nothing more than modifications of the normal condition' (in Canguilhem, 2012: 2). Canguilhem shared with Goldstein an attention to and recognition of the complexity of pathological experience and behavior in a way 'that was at odds with the positivist normative conception of health deriving from Comte' (p. 3). According to Canguilhem, positivist medicine and positivist conceptions of disease and biology reduced individual reactions to expressions of a disease, and considered them merely as 'aberrations from normality that could or could not be corrected; in so doing, they also effaced the experience of suffering and even of health itself'.

As we have seen, for Goldstein, pathological phenomena were not merely normless 'disordered' conditions or deviances from a 'supra-individual' statistical or 'idealistic' norm. He argued that the statistical norm 'cannot be used to determine whether a given individual is to be regarded as normal or abnormal. The statistical norm concept cannot do justice to the individual' (Goldstein, 1995: 326). And it is only the individual as a whole to which states of health, disease and normality can be ascribed. The normal and the pathological fundamentally depend upon the capacities and experiences of the individual and not upon isolated anatomical structures or processes. Goldstein showed with his patients that an understanding of particular modifications in

⁸³ See, for example, Canguilhem, *Knowledge of Life* (2008): 113-114 and 129-132 and *The Normal and the Pathological* (1991): 181-196.

individual performances and experiences was central to understanding disease. As Goldstein put it, 'pathological phenomena are the expression of the fact that the normal relationships between organism and environment have been changed through a change of the organism and that thereby many things that had been adequate for the normal organism are no longer adequate for the modified organism' (p. 328).

Goldstein's patients were abnormal not because of a lack of ordered behavior (apart from the catastrophic reactions) or because of a deviance from a healthy norm. Instead, Goldstein saw in his patients a tendency to establish a new relationship with the environment – a new norm of life – that was characterized by a tenacious adherence to concrete and ordered behavior in a new but narrowed environment. Disease is still a norm of life, albeit inferior in several ways: 'it tolerates no deviation from the conditions in which it is valid, incapable as it is of changing itself into another norm' (Canguilhem, 1991: 183). As Canguilhem paraphrases Goldstein and generalizes this point,

The norms of pathological life are those that oblige the organism to henceforth live in a 'shrunk' milieu, which differs qualitatively, structurally, from its former milieu of life; the organism is obliged by its incapacity to confront the demands of new milieus (in the form of reactions or undertakings dictated by new situations) to live exclusively in this shrunk milieu. (Canguilhem, 2008: 132)

Health, the vital contrary of 'pathological' or 'disease' implies something more than 'normality' in the sense of a life regulated by norms.

Now, to live, already for animals and even more so for man, is not merely to vegetate and conserve oneself. It is to confront risks and to triumph over them. Especially in man, health is precisely a certain latitude, a certain play in the norms of life and behavior. What characterizes health is a capacity to tolerate variations in norms on which only the stability of situations and milieus – seemingly guaranteed yet in fact always necessarily precarious – confers a deceptive value of definite normalcy. Man is truly healthy only when he is capable of several norms, when he is more than normal. (p. 132)

Exactly opposite to the positivist conception of disease as modifications from normal (physiological) functions, disease, at least for Goldstein and Canguilhem, is a conservative, defensive and static condition. As Goldstein's cases exemplify, the inability of the organism to shift modes of behavior, leave the 'sphere of immediacy,' and adapt to different environments characterizes the pathological condition. What Goldstein learned from pathology was that 'the tendency to self-preservation is characteristic of sick people ... For the sick person the only form of actualization of his capacities which remains is the maintenance of the existent state. ... Under adequate conditions the tendency of normal life is toward activity and progress' (Goldstein, 1963: 141-142). In Canguilhem's more philosophical terms: 'the sick living being is normalized in well-defined conditions of existence and has lost his *normative* capacity' (Canguilhem, 1991: 183, emphasis added). For Canguilhem, this 'normative capacity' is a prerequisite for health and it means 'the capacity to establish other norms in other conditions'. Health is more than a 'coming to terms with the world' by avoiding catastrophic situations. Instead, through Goldstein's extensive experience with pathological conditions, he came to see the urge for new experiences, 'for the conquest of the world, and for an expansion of his sphere of activity in a practical and spiritual sense' (Goldstein, 1995: 238) as an expression of the organism's 'natural' tendency to realize or actualize its own essence. An organism is truly healthy when this 'tendency toward self-actualization is coming from within' and when it 'overcomes the disturbance arising from the clash with the world, not out of anxiety but out of joy of conquest' (p. 239).⁸⁴

As health and disease fundamentally depend upon the (modified) performances of the individual as a whole, expressed by Goldstein in terms of 'self-preservation,' 'self-actualization' and a 'coming to terms with the world,' it is only in relation to particular circumstances that an individual can be called abnormal. 'The sick person must always be judged in terms of the situation to which he is reacting and the instruments of action which the environment itself offers him ... There is no pathological disturbance in itself: the abnormal can be evaluated only in terms of a relationship' (Canguilhem, 1991: 188). Consequently, the divergence from a physiological, anatomical, behavioral or

⁸⁴ Obviously, Goldstein's (crypto-) teleological image of man is not unambiguous. For discussions on vitalism and teleology in relation to the work of Goldstein, see Ferrario and Corsi (2013).

neuropsychological constant becomes pathological only in relation to a personal ‘milieu of life’ in which certain tasks have become unavoidable for the individual living being. Furthermore, and this makes up the core of Goldstein’s holistic approach, it is always the totality of the organism that attempts to come to terms with the world or reacts catastrophically in relation to the milieu. All this implies that the ‘pathological in man cannot remain strictly biological, for human activity, work, and culture have immediate effect of constantly altering the milieu of human life’ (Canguilhem, 2008: 128).

However, the fact that, for instance, an anatomical irregularity can become pathological in one person and normal in the other, does not lead to the conclusion that a distinction between the normal and the pathological cannot be made. To individualize the norm and the normal does not erase this distinction, nor does it mean that individuals always react differently in similar situations. Goldstein’s holism – the effort to explain disease by referring to the individual’s tendency for wholeness in its way of dealing with its situation – made Canguilhem conclude ‘that human biology and medicine are, and always have been, necessary parts of an “anthropology.” ... [and] that there is no anthropology that does not presuppose a morality, such that the concept of the “normal,” when considered within the human order, always remains a normative concept of properly philosophical scope’ (p. 133).

Beyond autism: A person-centered style of psychiatric thought

Now let us get back to where we started: autism. In my attempt to sidestep the idea of autism as a distinct disease entity by searching for an alternative understanding of disease, it is not a coincidence that I came up with Goldstein’s work. Even though he mentioned autism in only one of his many papers (Goldstein, 1959), his ideas about the abstract capacity and what happens when a patient loses this capacity, fit, as we have seen, strikingly well with the behavior of those diagnosed with autism. Besides Goldstein’s own examples of cortical brain injuries, autistic behavior could even be regarded as a paradigmatic case for his particular holistic approach. However, remarkably enough, Goldstein’s interpretation of autistic behavior and his holistic approach to disease have been largely neglected in autism research, the history of autism and psychiatry in general. His paper *Abnormal Mental Conditions in Infancy* (1959)

has only been cited some thirty times, while Kanner's landmark paper on autism (Kanner, 1943) has become the central reference and starting point in autism research and has been cited more than 7000 times. Goldstein's lack of impact on autism research becomes somewhat less remarkable when we consider the fact that Goldstein and Kanner not only interpreted autistic behavior differently, but they also had very different concepts of disease and more broadly, a very different 'style of psychiatric thought' (Verhoeff, 2014/Chapter 4).

In line with Kanner's disease entity approach to autism, the current field of autism research and practice, like psychiatry in general, is structured around disease categories and the idea of specific pathophysiological processes. Goldstein's approach to medicine is indeed radically different and although it never translated into an active and established clinical or research practice,⁸⁵ his work is extremely rich and cohesive in a sense that it connects a broad range of experimental, theoretical, conceptual, therapeutic, diagnostic, anthropological and philosophical elements. Due to the cohesive and thoroughly different way of explaining and looking at behavioral ailments, Goldstein's work provides something of a conceivable alternative framework for current understandings of autism. In the spirit of Ludwik Fleck (1935/1979) and in contrast with the current biomedical approach to autism, I consider Goldstein's approach an example of a person-centered style of psychiatric thought. How such a different style comprises new ways to think about, investigate and intervene with the behavior we have come to call autism can be illustrated by pointing out some general differences with the current biomedical approach or 'style of psychiatric thought' in the field of autism.

As I mentioned in the introduction, an ontological understanding of disease, in which psychiatric diseases exist independently of their appearances in individuals, is what makes the idea of autism as a psychiatric disease possible. For Goldstein, in contrast, disease and symptoms can only be understood by taking the particular circumstances of the whole person into account. It is the history of the entire person and not a natural history of an assumed disease entity that is central in this 'individual understanding of disease'. Hence, a

⁸⁵ Nevertheless, Goldstein's work has been important for the emergence and development of humanistic psychology (Noppeney, 2001).

disease category like autism, in which underlying pathophysiological processes are thought to cause and explain the visible signs and symptoms, simply does not make much sense when particular behaviors can *only* be understood with reference to the tendencies of the entire individual. Likewise, the diagnostic practice of structuring different symptoms and signs in order to diagnose or exclude a particular disorder, or to distinguish a distinct disease picture from other conditions such as ADHD, becomes unthinkable. Instead of disease entities, individual performances and experiences are the central units of a ‘Goldsteinian’ medical analysis.

Moreover, in a ‘Goldsteinian’ approach, diagnostic interviews and observations are not focused on detecting and revealing deviances from an ideal or statistical norm, such as the behavioral deviances that are expressed in the *DSM-5* (for example, ‘highly restricted, fixated interests that are abnormal in intensity or focus,’ ‘abnormal social approach and failure of normal back-and-forth conversation’ or ‘abnormalities in eye contact and body language’ (APA, 2013) as criteria for autism spectrum disorder). Nor will these symptoms, and the impairment and suffering that derive from them, be interpreted as expressions of malfunctioning neurobiological circuits that underlie social cognition and behavior. Instead, following Goldstein’s line of thought, mental health professionals will emphasize an individual’s specific attempts, possibilities and limitations to come into an ordered relationship with the surrounding world.

Furthermore, central clinical and research topics will not put emphasis on how and to what extent patients deviate from behavioral, socio-cognitive or neurobiological norms or which cluster of symptoms forms a valid disease category; instead they concern the way in which symptoms, phenomena, experiences and performances are functionally significant for the whole organism and how they relate to the (in)abilities to cope with demands from the (social) environment. Goldstein’s style of medical thought also includes a focus on the way in which particular environments, for instance at school, at home, or in the community, are inextricably linked to healthy and pathological conditions, instead of seeing environmental factors only as external etiological factors that affect distinct pathophysiological processes. It also includes a focus on (the reduction of) the capacities and possibilities to reshape one’s personal milieu, on the occurrence and avoidance of catastrophic situations, or in Canguilhem’s terms, on how individuals express and overcome a reduction in

the ‘margin of tolerance for the inconstancies of the environment’ (Canguilhem, 1991: 197). Moreover, treatments do not primarily aim at correcting dysfunctions towards a normal state, but instead they aim at creating or regaining ‘responsiveness’ or ‘normativity’. That is, enabling someone to get a grip on new situations, adapt to new circumstances, overcome difficulties, and to live a life beyond ‘the maintenance of the existent state’ (Goldstein, 1963: 141). In short, biomedical and person-centered styles of psychiatric thought each involve a distinct psychiatric gaze, with different problems to be solved that are expressed in different terms, against different background ideas about disease, normality, the environment, and what a proper treatment requires.

Conclusions

The aim of this paper was to present something of a conceivable alternative framework for understanding disease and the difficulties, impairments and suffering of those we have come to call autistic, without actually referring to the disease category of autism. I have argued that an approach in the style of Goldstein circumvents the idea of autism by providing a completely different understanding of disease. No matter how ‘syndromic,’ meaningless and neurobiologically determined the repetitive behaviors and restricted interests of autism patients may look, Goldstein shows that current understandings of autism are less inevitable as they seem. Obviously, this anachronistic move of bringing Goldstein’s approach to the present is hypothetical, and we are currently far away from a person-centered style of psychiatric thought. Today’s psychiatry does not start with the experiences, performances and impairments of the individual; rather, psychiatry is trying very hard to become ‘applied neuroscience’ (Bracken et al., 2012). However, Goldstein’s anthropocentric perspective is attractive for several reasons, and not only for the clinic but also for the research lab.

At first, Goldstein’s holism goes beyond the traditional divides that mark contemporary psychiatric thought – the divides between biological mechanisms and social factors and contexts and between ‘the disease’ and ‘its milieu’. And these are precisely the divides that seem to drive autism research and clinical practice further apart. The existing gap between the uncertain search for autism’s neurobiological specificity and the everyday, highly contextual ailments

of those diagnosed with autism does not give much hope for future clinically valuable translations from the biomedical sciences. Psychiatric (autism) research that focuses more on the development, abilities, performances, impairments and distress of the total human being that constantly shapes and is being shaped by his surrounding world, could be a first step in bridging this gap.

Secondly, Goldstein's conception of disease and normality avoids the contradictory attempts to demarcate 'abnormal' *social* behavior by identifying malfunctioning *biological* mechanisms. Currently, the boundaries of autism depend more on creating a coherent ('valid') disease entity that should enable the identification of a neurobiological substrate, than on ideas about where normal social behavior ends and abnormality starts. For Goldstein, as we have seen, there is no pathological behavior or disturbance in itself, and the 'abnormal' should be evaluated only in terms of a relationship between the individual and his surrounding world. Instead of leaving the demarcation of autism and disease to the biomedical sciences, including statistics and epidemiology, these issues become, as Canguilhem also argued, explicitly part of an anthropology and hence, a morality. This implies for psychiatry what most psychiatrists already know: that psychiatry is, and will be, much more than 'applied neuroscience'.

References

- APA (2013) *Diagnostic and Statistical Manual of Mental Disorders, 5th edition*. Washington, DC: American Psychiatric Association.
- Bauman MD and Schumann CM (2013) Is "bench to bedside" realistic for autism? An integrative neuroscience approach. *Neuropsychiatry* 3: 159-168.
- Bishop DVM (2010) Which neurodevelopmental disorders get researched and why? *PloS One* 5: e155112.
- Bracken et al. (2012) Psychiatry beyond the current paradigm. *British Journal of Psychiatry* 201: 430-434.
- Buescher AVS, Cidav Z, Knapp M and Mandell DS (2014). Costs of Autism Spectrum Disorders in the United Kingdom and the United States. *JAMA Pediatrics* 8: 721-728.
- Canguilhem G (1991) *The Normal and the Pathological*. New York: Zone Books.

- Canguilhem G (2008) *Knowledge of Life*. New York: Fordham University Press.
- Canguilhem G (2012) *Writings on Medicine*. New York: Fordham University Press.
- Cuthbert BN and Insel TR (2013) Toward the future of psychiatric diagnosis: the seven pillars of RDoC. *BMC Medicine* 11: 126.
- Evans B (2013) How autism became autism: The radical transformation of a central concept of child development in Britain. *History of the Human Sciences* 26: 3-31.
- Ferrario CE and Corsi L (2013) Vitalism and Teleology in Kurt Goldstein's Organismic Approach. In Normandin S and Wolfe CT (eds) *Vitalism and the Scientific Image in Post-Enlightenment Life Science, 1800-2010*. Dordrecht: Springer, 205-241.
- Fleck L (1979) *Genesis and Development of a Scientific Fact*. Chicago, IL: University of Chicago Press.
- Frances AJ (2013) *Saving Normal: An Insider's Revolt Against Out-of-Control Psychiatric Diagnosis, DSM-5, Big Pharma, and the Medicalization of Ordinary Life*. New York: William Morrow.
- Geroulanos S and Meyers T (2012) Introduction: Georges Canguilhem's Critique of Medical Reason. In *Writings on Medicine* by G Canguilhem, 1-24. New York: Fordham University Press.
- Goldstein K (1959) Abnormal Mental Conditions in Infancy. *Journal of Nervous and Mental Disease* 128: 538-557.
- Goldstein K (1963) *Human Nature in the Light of Psychopathology*. Oxford, England: Harvard University Press.
- Goldstein K (1995) *The Organism: A Holistic Approach to Biology Derived from Pathological Data in Man*. Cambridge, MA: MIT Press.
- Goldstein K and Scheerer M (1941) Abstract and concrete behavior an experimental study with special tests. *Psychological Monographs* 53: 1-10.
- Happé F and Frith U (2014) Towards a developmental neuroscience of atypical social cognition. *Journal of Child Psychology and Psychiatry* 55: 553-577.
- Harrington A (1998) Kurt Goldstein's neurology of healing and wholeness: A Weimar story. In Lawrence C and Weisz G (eds) *Greater than the parts: holism in biomedicine*. New York: Oxford University Press, 25-45.
- Hau M (2000) The Holistic Gaze in German Medicine, 1890-1930. *Bulletin of the History of Medicine* 74: 495-524.

- Insel TR (2014) Mental disorders in childhood: shifting the focus from behavioral symptoms to neurodevelopmental trajectories. *JAMA* 311: 1727-1728.
- Jeste SS and Geschwind DH (2014) Disentangling the heterogeneity of autism spectrum disorder through genetic findings. *Nature Reviews Neurology* 10: 74-81.
- Jutel A (2013) When Pigs Could Fly: Influenza and the Elusive Nature of Diagnosis. *Perspectives in Biology and Medicine* 56: 513-529.
- Kanner L (1943) Autistic disturbances of affective contact. *Nervous Child* 2: 217-250.
- Kapur S, Phillips AG and Insel TR (2012) Why has it taken so long for biological psychiatry to develop clinical tests and what to do about it? *Molecular Psychiatry* 17: 1174-1179.
- Kennedy DP and Adolphs R (2012) The social brain in psychiatric and neurological disorders. *Trends in Cognitive Science* 16: 559-572.
- Noppeney U (2001) Kurt Goldstein – A Philosophical Scientist. *Journal of the History of the Neurosciences* 10: 67-78.
- Rosenberg CE (1998) Holism in Twentieth-Century Medicine. In Lawrence C and Weisz G (eds) *Greater than the parts: holism in biomedicine*. New York: Oxford University Press, 335-356.
- Rosenberg CE (2002) The tyranny of diagnosis: Specific entities and individual experience. *Milbank Quarterly* 80: 237-260.
- Rosenberg CE (2006) Contested boundaries: Psychiatry, disease, and diagnosis. *Perspectives in Biology and Medicine* 49: 407-424.
- Rutter M (2014) Addressing the issue of fractionation in autism spectrum disorder: A commentary on Brunson and Happé, Frazier et al., Hobson and Mandy et al. *Autism* 18: 55-57.
- Silverman C (2008) Fieldwork on another planet: Social science perspectives on the autism spectrum. *BioSocieties* 3: 325-341.
- Temkin O (1977) *The Double Face of Janus and other Essays in the History of Medicine*. Baltimore, MD: John Hopkins University Press.
- Verhoeff B (2013) The autism puzzle: challenging a mechanistic model on conceptual and historical grounds. *Philosophy Ethics Humanities and Medicine* 8: 17.

- Verhoeff B (2014) Stabilizing autism: A Fleckian account of the rise of a neurodevelopmental spectrum disorder. *Studies in History and Philosophy of Biological and Biomedical Sciences* 46: 65-78.
- Waterhouse L (2013) *Rethinking Autism: Variation and Complexity*. San Diego, CA: Academic Press.